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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,726	11/17/2003	Mario Merlin	IR-2261	4657
2352	7590	10/06/2005	EXAMINER	
OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403			IM, JUNGHWA M	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/714,726	Applicant(s) MERLIN ET AL.	
	Examiner Junghwa M. Im	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9-12 and 14-19 is/are rejected.
- 7) ☒ Claim(s) 4-8, 13 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz et al. (US 6060776), hereinafter Spitz in view of Lebby et al. (US 5838703), hereinafter Lebby.

Regarding claim 1, Fig. 1 of Spitz shows a semiconductor device package, comprising a base portion [3], a semiconductor die [4] electrically mounted on the base portion, a lead [8] electrically coupled to the die, a perimeter wall [12] to the base portion and an encapsulant [13] filling at least a portion of the space within the perimeter wall and encapsulating the die and a portion of the lead.

Fig. 1 of Spitz shows most aspect of the instant invention except "a perimeter wall snap fitted to the base portion." Fig. 1 of Lebby shows a semiconductor device with a perimeter wall [30] snap fitted to the base portion [21].

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Lebby to the device of Spitz in order to have the wall snap fitted to the base portion to lock the mounting structure to the perimeter wall.

Regarding claim 2, Fig. 1 of Spitz shows the die including a top surface and a bottom surface opposite of the top surface, and it is inherent that the die in Fig. 1 of Spitz has a bottom

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and a top electrode. Fig. 1 of Spitz shows the bottom (electrode) is soldered to the base portion [5b], the lead is soldered to the top (electrode) [5a], such that the lead, the die and the base portion are electrically connected.

Regarding claim 3, Fig. 1 of Leiby shows the perimeter wall includes an inwardly extending bulge positioned at a lower portion of the perimeter wall such that the bulge snap fits to the base portion.

Regarding claim 9, Fig. 1 of Spitz shows the lead [8] comprises a lower portion [7] coupled to the top electrode of the die and a stem portion joined to the lower portion.

Regarding claim 17, Fig. 1 of Spitz shows a semiconductor device package, comprising:
a base portion [2] comprising an upper surface,
a lower surface opposite of the upper surface and a sidewall [9] extending between the upper surface and the lower surface, a portion of the sidewall defining a recessed portion;
a semiconductor die [4] having a bottom surface electrically mounted on the upper surface of the base portion and having a top surface opposite of the bottom surface;
a lead [8] electrically mounted on the top surface of the die such that the lead forms an electrical terminal for the package;
a perimeter wall [12]; and
an encapsulant filling [14] at least a portion of the space within the perimeter wall, encapsulating a portion of the lead and the die.

Fig. 1 of Spitz shows most aspect of the instant invention except “a perimeter wall including a lip extending inwardly from the perimeter wall such that the lip is capable of being snapped into the recessed portion of the base portion, securing the ring to the base portion.” Fig.

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1 of Lebby shows a semiconductor device with a perimeter wall [30] including a lip [32] extending inwardly from the perimeter wall such that the lip is capable of being snapped into the recessed portion of the base portion, securing the upper portion to the base portion [21].

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Lebby to the device of Spitz in order to have a perimeter wall including a lip extending inwardly from the perimeter wall such that the lip is capable of being snapped into the recessed portion of the base portion to lock the mounting structure to the perimeter wall.

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz and Lebby as applied to claim 9 above, and further in view of Wasmer et al. (US 5005069), hereinafter Wasmer.

Regarding claim 10, the combined teachings of Spitz and Lebby show most aspect of the instant invention except “the lower portion of the lead is comprised of copper or a copper alloy.” Fig. 4 of Wasmer shows the lower portion of the lead [173] is comprised of copper or a copper alloy (col. 4, lines 44-51).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Wasmer to the device of Spitz and Lebby in order to have the lower portion of the lead comprised of a copper alloy to improve the contact of the lead to the electrode of die.

Regarding claim 11, Wasmer discloses that the stem portion of the lead is comprised of copper or a copper alloy (col. 4, lines 44-51).

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Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz and Lebby as applied to claim 3 above, and further in view of Barnett et al. (US 6541800), hereinafter Barnett.

Regarding claim 14, the combined teachings of Spitz and Lebby show most aspect of the instant invention except "the perimeter wall is comprised of a composite material formed into an annular shape." Fig. 3 of Barnett shows the perimeter wall [a lower portion of the lens 18] is comprised of a composite material [col. 6, lines 7-10] formed into an annular shape.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Barnett to the device of Spitz and Lebby in order to have the perimeter wall comprised of a composite material formed into an annular shape to utilize the well known material for easier formation of annular shape.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz and Lebby as applied to claim 17 above, and further in view of Barnett.

Regarding claim 18, the combined teachings of Spitz and Lebby show most aspect of the instant invention except "the base portion further comprises a threaded extension, and the threaded extension extends in a direction normal to the lower surface." Fig. 9A of Barnett shows that "the base portion further comprises a threaded extension, and the threaded extension extends in a direction normal to the lower surface."

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Barnett to the device of Spitz and Lebby in order to have a threaded extension of the base portion, and the threaded extension extending in a direction

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normal to the lower surface to enable the connection to the complementary structure in the package.

Regarding claim 19, Fig. 9A of Barnett shows the perimeter wall (a portion below the dome) is annular and the recessed portion is a radially cylindrical groove.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz, Lebby and Wasmer as applied to claim 11 above, and further in view of Yoshinaga et al. (US 5886403), hereinafter Yoshinaga.

Regarding claim 12, the combined teachings of Spitz, Lebby and Wasmer show most aspect of the instant invention except “the lower portion and the stem portion of the lead are joined by capacitance discharge soldering using an eutectic solder.” Yoshinaga discloses that the lower portion and the stem portion of the lead are joined by using an eutectic solder (a low melting solder; col. 4, lines 14-17), therefore joined by capacitance discharge soldering.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Yoshinaga to the device of Spitz, Lebby and Wasmer in order to have the lower portion and the stem portion of the lead joined by capacitance discharge soldering using an eutectic solder to alleviate the pressure on the die from the high heat.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz Lebby and Barnett as applied to claim 14 above, and further in view of Kagi et al. (US 6821613), hereinafter Kagi.

Regarding claim 15, the combined teachings of Spitz, Lebby and Barnett show most aspect of the instant invention except “the composite material is polyphenylsulfide reinforced by glass fibers.” Kagi discloses that the composite material of polyphenylsulfide reinforced by glass fibers (col. 12, lines 20-28).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Kagi to the device of Spitz, Lebby and Barnett in order to have the composite material of polyphenylsulfide reinforced by glass fibers to improve the structural strength.

Regarding claim 16, the combined teachings of Spitz, Lebby, Barnett and Kagi fail to the glass fiber comprises about 40% of the composite. However, it would have been obvious to one of ordinary skill in the art at the time of the invention made to have an intended glass fiber content for the composite material recited in pending claim, since it would have been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only in routine skill in the art. *In re Aller*, 105 USPQ 233.

Allowable Subject Matter

Claims 4-8, 13 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior art fails to teach or render obvious a semiconductor device with combinations of elements as set forth in the claim 4, including in particular a base shelf with a base sidewall and an intermediate shelf on the base shelf while the intermediate shelf having intermediate sidewall

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with a recess and the intermediate shelf being configured to have the bulge of the perimeter wall snap-fitting onto the recess of the intermediate shelf.

Prior art fails to teach or render obvious a semiconductor device with combinations of elements as set forth in the claim 20, including in particular the base portion comprised of a nickel plated copper, the annular ring comprised of a composite of polyphenylsulfide reinforced by glass fibers, and the lead comprising a lower portion of copper or a copper alloy mounted on the top surface of the die and a stem portion of iron or iron alloy joined to the lower portion by an eutectic solder.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junghwa M. Im whose telephone number is (571) 272-1655. The examiner can normally be reached on MON.-FRI. 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Loke can be reached on (571) 272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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